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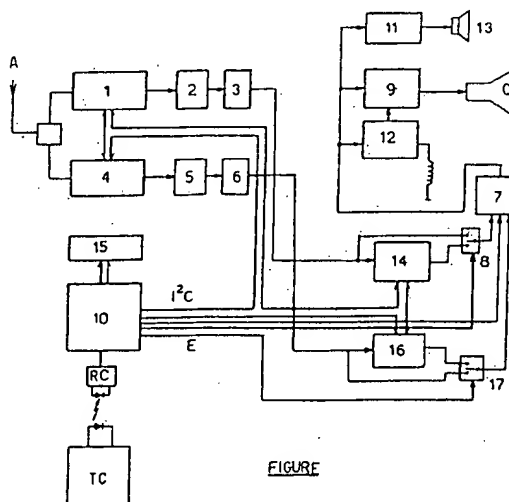
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⑤ Improved receiver of teletext transmissions.

57) The present invention relates to a teletext transmissions receiver comprising means to receive a television signal, decoder means for obtaining also the associated teletext signal and display means to show a first chosen page; the main characteristic of the invention consists in that the receiver includes an additional means to also show simultaneously a second chosen page different from the first.



**EP 0 489 387 A2**

The present invention relates to a teletext transmissions receiver comprising means to receive a television signal, decoder means for obtaining also the associated teletext signal and display means to show a first chosen page.

There are known teletext transmissions receivers that include means to receive a television signal and obtain the relative video signal, destined to be shown by means of a special image reproducing apparatus, and also comprising decoder means for obtaining also the eventual signal (known in Italy as RAI teletext) associated to it. This signal consists of a library of numbered pages that are transmitted in sequence during some lines of the field blanking of the television signal; said pages are opportunely encoded and for their reception a special decoder is necessary. The decoder allows to show one page, selected by the user among those transmitted, alternatively to or superimposed on the normal television image.

There are also known television signals receivers that are able to show simultaneously on the screen, images that belong to two or more different television channels.

Generally the image or the additional images are of a minor dimension than that of the main one; for example a second image is typically reproduced in one angle of the main image, with a reduced size of about a third; in many cases it is possible to vary the sizes of such a second image.

This procedure is commonly designated with the initial P.I.P. taken from the English words Picture In Picture.

Said known receivers do not however consent to show two pages simultaneously.

The invention is based on the recognition of the fact that in certain cases it would be very useful to be able to consult simultaneously two teletext pages, for example to be able to consult a specific page without losing sight of the index page.

The aim of the present invention is therefore to indicate a teletext transmission receiver more flexible than those known, able to satisfy the needs of the user not satisfied with the known receivers.

To achieve this aim the present invention has as its object a teletext transmission receiver, with means to receive a television signal, a decoder means for obtaining the associated teletext signal and a display means to show a first chosen teletext page, characterized in that the receiver includes an additional means to show a second chosen teletext page simultaneously, different from the first.

Further aims and advantages of the present invention will result clear from the description that follows and from the annexed drawings, supplied as an explicit and non limitative example, in which: The figure schematically represents the diagram of a receiver of teletext transmission according to the

invention.

In the figure the reference letter A indicates the aerial, connected to the receiver in order to pick up teletext transmission available. Said aerial is connected to two conventional tuners indicated respectively with the reference numbers 1 and 4; to said tuners two signals amplifiers follow of intermediate frequency, also conventional, indicated respectively with the numbers 2 and 5.

The amplifier 2 is connected in its output to a video detector 3; the amplifier 5, on its part, is connected in output to a video detector 6.

The detector circuit 3 is connected to a block 14 that contains a teletext signal decoder, of a known type, and, downstream, a converter circuit from RGB signals to composite video PAL signals (for example a type integrated circuit MC 1377 of the firm Motorola); the detector circuit 3 and the block 14 are then connected to a commutation circuit video of signals 8; the video detector 6, on its part, is connected to a block 16, equal to the block 14; the detector 6 and the block 16 are connected to the commutation circuit 17, equal to the circuit 8; the two commutators 8 and 17 are both controlled from a processor 10, comprising a microprocessor circuit of known type, that provides, depending of the cases, to control them in order to assure that at their output are present the signals of the normal images, or the teletext pages. The exit of the two commutators 8 and 17 are connected to circuit 7 signals manipulator comprising also a memory, so called, of the control board; in its turn connected with the processor 10. The circuit 7 is of a known type (for example the part that acts as a signals commutator, can be made using an integrated circuit 2014) and is able to combine and to memorize the relative video signals to one or more images and, under the control of the processor 10, is thus possible to send to the successive video circuit amplifier 9, a combined image (of the designated type exactly P.I.P.) containing for example a main image (corresponding to the video signal coming from the chain 4, 5, 6) and a second different image of reduced size situated in an angle of the first (corresponding to the video signal coming from chain 1, 2, 3). Such combined image is then shown by the television image reproducer indicated with the letter C, represented for example by a normal colour picture-tube, or other image display of type known.

The circuit 11 is a normal audio signal amplifying chain, driving an acoustic reproducer 13; the circuit 12 is a normal signal generation block of deflection for the image reproducer C.

Naturally provided, even if not represented in the figure, for simple reasons, are known means of selecting signals, associated to the main chain (4, 5, 6) as to that of the secondary (1, 2, 3), prefer-

ably of the type to synthesis of frequency with two P.L.L. (for example of the type TSA 5510 by Philips), inserted respectively in the syntonizers 1 and 4 and commanded through the I2C bus of the microprocessor 10.

Appropriately commanding the commutators B and 17 and the mixer 7, it is possible to obtain on the screen of the image reproducer C various images:

- the television image of the main channel (1,2,3);
- a Teletext page of the main channel;
- the television image of the main channel together with the reduced television image of the secondary channel (4,5,6);
- a Teletext page of the main channel, together with the reduced image of a Teletext page of the secondary channel;
- the television image of the main channel together with the reduced image of a Teletext page of the secondary channel;
- a Teletext page of the main channel, together with the reduced television image of the secondary channel.

Acting also on the syntonization of the two tuners, and precisely tuning them both to the same television signal, two other combinations are possible:

- the television image of the main channel together with the reduced image of a Teletext page of the same signal;
- a Teletext page of the main channel, together with the reduced image of another Teletext page of the same signal.

In the case in which the reduced secondary image is that of a teletext page, it is advisable, so as to guarantee the legibility, that its dimensions are equal to about half of those of the main image.

The microprocessor receives the appropriate command signals from the user through a telecontrol device of the type known (TC/RC); among such command signals there will also be one to decide whether there has to be shown on the screen the television image of the main channel or the Teletext pages of the same; and another to decide in analog order regarding the secondary channel.

Such command signals will for example be obtained by means of one or more dedicated buttons of said telecontrol.

Naturally to manage the video reproduction there shall be provided an analog command system of the processor 7; to decide whether or not to also show the secondary video signal (as in any normal receiver of the type P.I.P.).

It is also provided a system of auxiliary visualization, indicated with the reference number 15, that serves to show the relative Teletext information (number of the requested page, number of the

page received, Etc), useful particularly during the acquisition phase, in the case of superimposing a signal withdrawn from the secondary signal on the television image of the main signal. In fact in such a case and during the acquisition such information cannot be shown in the normal way, for the incompatibility of the pertinent synchronism signals to the two different television channels.

Such system of auxiliary visualization can consist of a separate conventional display, or could also be obtained with the known method O.S.D. (on screen display) on the main screen.

The characteristics of the receiver of teletext transmissions described are made clear by the description and the annexed drawings. From the description the advantages of receiver Teletext transmissions object of the present invention are also clear.

In particular they consist in that it is possible to consult simultaneously two different pages.

It is clear that the receiver of Teletext transmissions described is more flexible of than those known; it is also clear that numerous variants can be supplied by man skilled in the art, to the receiver of Teletext transmissions described as an example, without leaving the principles of novelty pertinent to the invention.

For example it is not necessary that the receiver includes two tuners and two Teletext decoders; it is enough, to see two different Teletext pages simultaneously, associated to the same television signal, to have at disposal a single tuner and a single teletext decoder, providing a cyclic commutation of the page received on two page memories; a page will be then shown as a main image and the other as a secondary image. In this version the tagged circuits in the Figure with the numbers 4, 5, 6, 16 and 17 become superfluous; there is a page memory added (but normally teletext decoders already have at least four) and a commutator, similar to the circuit 17, always managed by the processor 10.

#### Claims

1. A Teletext transmission's receiver, comprising means (1,2,3) to receive a television signal, decode means (14) to obtain also the associated teletext signal and display means (C) to show a first chosen teletext page, characterized in that the receiver includes additional means (7,16,17) to simultaneously show a second chosen teletext page, different from the first one.
2. A Teletext transmissions receiver, according to claim 1, characterized in that said additional means include a second teletext decoder (16).

3. A Teletext transmissions receiver, according to claim 1 or 2, characterized in that said additional means includes a device of the type P.I.P. (7) to show the second page with reduced dimensions, in the place of a part of the first.

4. A Teletext transmissions receiver, according to claim 1, characterized in that said additional means includes a second page memory (16) and a commutator (17).

5. A Teletext transmissions receiver, according to claim 3, characterized in that said receiver includes a second television signal tuner (4), to receive besides the main channel (1,2,3) also a secondary channel (4,5,6) simultaneously.

6. A Teletext transmissions receiver, according to claim 5, characterized in that said receiver includes commutation means of the video signal (8,17) in order to visualize and select one of the following combinations:

- the television image of the main channel (1,2,3);
- a Teletext page of the main channel (1,2,3)
- the television image of the main channel together with the reduced television image of the secondary channel (4,5,6);
- a Teletext page of the main channel (1,2,3), together with the reduced image of a Teletext page of the secondary channel (4,5,6);
- the television image of the main channel (1,2,3) together with the reduced image of a Teletext page of the secondary channel (4,5,6);
- a Teletext page of the main channel (1,2,3), together with the reduced television image of the secondary channel (4,5,6).
- the television image of the main channel (1,2,3) together with the reduced image of a Teletext page of the same signal;
- a teletext page of the main channel (1,2,3), together with the reduced image of another teletext page of the same signal.

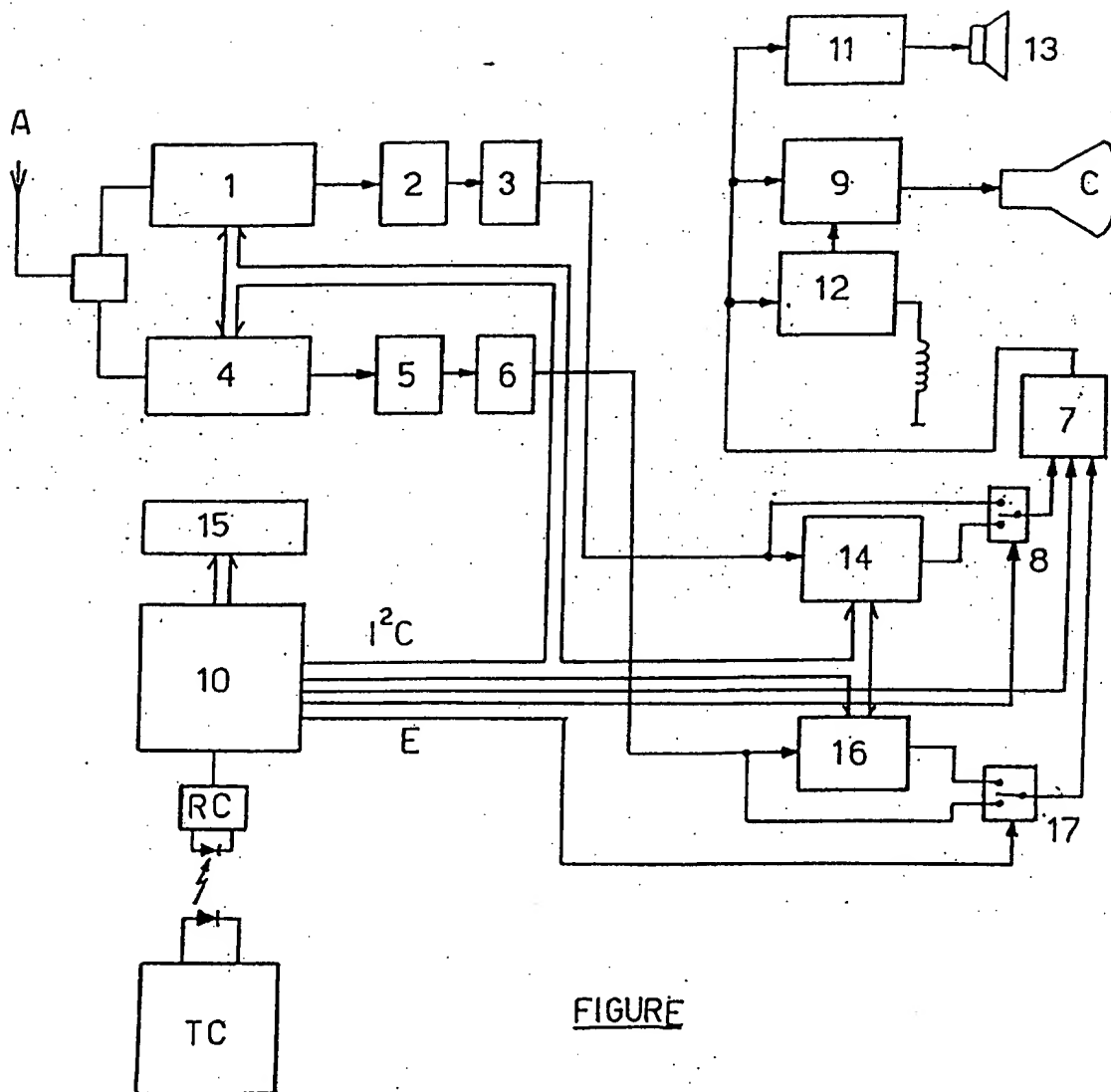
7. A Teletext transmissions receiver, according to one of the previous claims, characterized in that said receiver includes a microprocessor (10) that controls said additional means (7,16,17).

8. A Teletext transmissions receiver, according to claim 7, characterized in that said receiver

includes a telecontrol device (TC,RC) associated to said microprocessor (10).

9. A Teletext transmissions receiver, according to one of the previous claims, characterized in that said receiver includes a visualisation device (15) to show the number of said second teletext page.

10. A Teletext transmissions receiver according to the present description and annexed drawing.



FIGURE

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